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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/533,853

05/04/2005

Tsuyoshi Okada

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7590

11/20/2006

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EXAMINER

BOOSALIS, FANI POLYZOS

ART UNIT

PAPER NUMBER

2884

DATE MAILED: 11/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/533,853

Applicant(s)

OKADA ET AL.

Examiner

Faye Boosalis

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2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 5/4/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. Applicant is advised that should claim 4 be found allowable, claim 5 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

2. Applicant is advised that should claim 8 be found allowable, claim 9 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Keiichi et al* (JP 2002-142228) in view of *Toshio et al* (JP 06-205162) and *Carr et al* (US 4,238,760).

Regarding claim 1, Keiichi discloses an imaging device comprising: an optical system means in which three components (102)(103)(104) and other light than the visible light in different wavelength region severally form images at different location according to their wavelengths; and an imaging element which has a plurality of pixels (100)(101); wherein the plurality of pixels include pixels (101) having a visible light detection means and pixels (100) having other light detection means (See PURPOSE and CONSTITUTION). Keiichi does not disclose the other light other than visible is near infrared or forming an image in a pixel at a location of a depth. Toshio discloses one image pickup device for independently obtaining a color image and a near-infrared light image. Toshio teaches a color filter (Cy), (Ye) and (Mg) and a filter (X) with near constant transmittance regardless of wavelength visible light and near-infrared light regions are formed at each pixel formed by CMOS having sensitivity in the visible light and the near-infrared light (See SOLUTION). Carr discloses multi-spectrum photodiode device wherein near infrared light detection means detecting near infrared light which forms an image in a pixel at a location of a depth different from the depths at which the three components of visible light form images (col. 2, lines 9-22). Carr teaches one or more photoelectric device elements are formed beneath the surface of a monolithic semiconductor structure below a surface photoelectric detector device to form a plurality of photoelectric devices having different spectral responses. The surface element is responsive to visible light and the one or more subsurface devices are sensitive to longer wavelength radiation depending upon the depth of the device below the surface of the structure. A two dimensional array of the devices may be formed in a single

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semiconductor wafer to provide a self-scanning multi-element photosensor array (See Abstract). Therefore, it would have been obvious to modify the imaging device suggested by Keiichi, to include near-infrared light, as disclosed supra by Toshio, and detecting means which form an image in pixel at location of different depths, as disclosed supra by Carr, to allow for a more versatile imaging device.

Regarding claim 2, Toshio discloses wherein visible light detection means has three detector (210) which are provided at different locations according to wavelength dependence of light absorbed and detect visible light in three different wavelength regions of blue, green and red and other light than the visible light provided at a different location from the depths of the three detectors and detects other light than visible (See CONSTITUTION). Toshio does not disclose a detector which is provided at a location of a depth different from the depths of the three detectors and detects near infrared light. Carr discloses multi-spectrum photodiode device wherein near infrared light detection means has a detector which is provided at a location of a depth different from the depth of the three detectors (visible light) and detects near infrared light (col. 2, lines 9-22). Carr teaches one or more photoelectric device elements are formed beneath the surface of a monolithic semiconductor structure below a surface photoelectric detector device to form a plurality of photoelectric devices having different spectral responses. The surface element is responsive to visible light and the one or more subsurface devices are sensitive to longer wavelength radiation depending upon the depth of the device below the surface of the structure. A two dimensional array of the devices may be formed in a single semiconductor wafer to provide a self-scanning multi-element

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photosensor array (See Abstract). Therefore, it would have been obvious to modify the imaging device suggested by Toshio, to include detecting means which form an image in pixel at location of different depths, as disclosed supra by Carr, to allow for a more versatile imaging device.

Regarding claim 3, Toshio discloses wherein image element has a configuration in which pixels having visible light detection means and pixels having other than visible light detection means are alternately arranged in rows and columns (See Fig. 1).

Regarding claim 4-5, although Toshio, Car or Keiichi disclose of a ratio of number of pixels, Keiichi does disclose imaging elements configured in pixels having three components of visible light detection and pixels having near-infrared light detection and therefore there would be a uniform arrangement of one to three.

Regarding claim 6, Keiichi discloses an imaging device comprising: an optical system means in which three components (102)(103)(104) of visible light and other light than the visible light in different wavelength region severally form images at different location according to their wavelengths; and an imaging element which has a plurality of pixels (100)(101); wherein the plurality of pixels detect the three components of visible light and other light than the visible light which form images at different locations according to their wavelength (See PURPOSE and CONSTITUTION). Keiichi does not disclose the other light other than visible is near infrared or forming an image in a pixel at a location of a depth. Toshio discloses one image pickup device for independently obtaining a color image and a near-infrared light image. Toshio teaches a color filter (Cy), (Ye) and (Mg) and a filter (X) with near constant transmittance regardless of

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wavelength visible light and near-infrared light regions are formed at each pixel formed by CMOS having sensitivity in the visible light and the near-infrared light (See SOLUTION). Carr discloses multi-spectrum photodiode device wherein near infrared light detection means detecting near infrared light which forms an image in a pixel at a location of a depth different from the depths at which the three components of visible light form images (col. 2, lines 9-22). Carr teaches one or more photoelectric device elements are formed beneath the surface of a monolithic semiconductor structure below a surface photoelectric detector device to form a plurality of photoelectric devices having different spectral responses. The surface element is responsive to visible light and the one or more subsurface devices are sensitive to longer wavelength radiation depending upon the depth of the device below the surface of the structure. A two dimensional array of the devices may be formed in a single semiconductor wafer to provide a self-scanning multi-element photosensor array (See Abstract). Therefore, it would have been obvious to modify the imaging device suggested by Keiichi, to include near-infrared light, as disclosed supra by Toshio, and detecting means which form an image in pixel at location of different depths, as disclosed supra by Carr, to allow for a more versatile imaging device.

Regarding claim 7, Carr discloses plurality of pixels detect visible light and near-infrared by means of multiple detectors (col. 1, lines 5-10).

Regarding claims 8-9, Carr discloses optical system means provides focal lengths with increase according to wavelengths of light visible light to near infrared light to form images at different locations (col. 2, lines 59-68 and col. 3, lines 1-14).

Regarding claim 10, Keiichi discloses an imaging method comprising: making three components (102)(103)(104) and other light than the visible light in different wavelength region severally form images at different location according to their wavelengths; detecting the three components of visible light and other light than the visible light using the fact that wavelength dependence of light absorption varies; and imaging pictures of both the three components of visible light and other light than the visible light(See PURPOSE and CONSTITUTION). Keiichi does not disclose the other light other than visible is near infrared or forming an image in a pixel at a location of a depth. Toshio discloses a method for image pickup devices for for independently obtaining a color image and a near-infrared light image. Toshio teaches a color filter (Cy), (Ye) and (Mg) and a filter (X) with near constant transmittance regardless of wavelength visible light and near-infrared light regions are formed at each pixel formed by CMOS having sensitivity in the visible light an the near-infrared light (See SOLUTION). Carr discloses a method for multi-spectrum photodiode detection wherein near infrared light detection means detecting near infrared light which forms an image in a pixel at a location of a depth different from the depths at which the three components of visible light form images (col. 2, lines 9-22). Carr teaches one or more photoelectric device elements are formed beneath the surface of a monolithic semiconductor structure below a surface photoelectric detector device to form a plurality of photoelectric devices having different spectral responses. The surface element is responsive to visible light and the one or more subsurface devices are sensitive to longer wavelength radiation depending upon the depth of the device below the surface

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of the structure. A two dimensional array of the devices may be formed in a single semiconductor wafer to provide a self-scanning multi-element photosensor array (See Abstract). Therefore, it would have been obvious to modify the method suggested by Keiichi, to include near-infrared light, as disclosed supra by Toshio, and detecting means which form an image in pixel at location of different depths, as disclosed supra by Carr, to allow for a more efficient multi-spectrum photodiode means of imaging.

Conclusion


3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Faye Boosalis whose telephone number is 571-272-2447. The examiner can normally be reached on Monday thru Friday from 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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5. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FB


OTÍLIA GABOR
PRIMARY EXAMINER